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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/398,189 09/17/99 KANAMORI

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EXAMINER

MMC2/1002

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BAO.S

ART UNIT

PAPER NUMBER

2814  
DATE MAILED:

10/02/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

**Office Action Summary**

Application No.

09/398,189

Applicant(s)

KANAMORI, JUN

Examiner

Steven H. Rao

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) 1-9 and 19-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-9 and 19-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 and 9 6) ☐ Other: \_\_\_\_\_

***Response to Amendment***

Applicants' request for a CPA along with the preliminary amendment filed July 12, 2001 has been entered on July 19, 2001.

Therefore claims 1-9 as amended in the amendment of November 17, 2000 and claims 19-22 as recited in the same amendment and claims 23 and 24 added by the amendment of July 12, 2001 are currently pending in the application.

***Information Disclosure Statement***

The information disclosure statement filed September 17, 1999 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

As previously indicated to the applicants' the parent case cited in the IDS namely U.S. Ser. No. 09/342751 is unavailable to the undersigned Examiner and requests to applicants' to provide copies have so far not resulted in the Examiner receiving a copy.

The IDS filed Oct. 20, 2000 was reviewed and initialed by the Examiner on Feb. 02, 2001 and the IDS filed on May 01, 2001 was reviewed and initialed by the Examiner on May 9, 2001.

The contract staff has been instructed to ensure copies of the above two IDS are enclosed with this Office Action.

For the record the Examiner on July 11, 2001 did not subsequently agree to consider the Ids, the Examiner stated that he would instruct the contract employees to ensure the previously considered ids are enclosed with the next Office Action.

***Claim Rejections - 35 USC § 112***

The previous rejection of claim 22 under section 112 second paragraph with respect to lines 3-5 of claim 22 are maintained. ( rejection reproduced : .. In lines 3-5 silicide regions completely formed and an appropriate amount of silicon remaining are indefinite and it not clear what applicants' mean by these expressions. Appropriate correction is required ).

Applicants' arguments that," the Examiner has acknowledged that that the corresponding language has been interpreted to mean the first-reacted silicide regions are completely formed and that silicon remains after the second RTA process".

This Examiner 's interpretation is based on the extent understood by the Examiner and does not absolve the Applicants' responsibility of correcting the claim language.

This requirement to correct the 112 rejection s made FINAL.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim1-9 and 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPR And Doan as previously applied to claims 1-9 and 19-22, and further in

view of Besser et al. ( U.S. Patent No./ 6,165,903, herein after Besser, cited by applicants' in their ids of May 01, 2001, herein after Besser).

With respect to claims 1-9, AAPR And Doan teach the steps of fabricating a semiconductor device using a self aligned silicide and a first RTA to form the silicide.

AAPR and Doan do not specifically state that a second supplemental silicon layer is provided over the first-reacted silicide region.

However, Besser in fig. 8 and col. 5 line 49- col. 6 line 4 describes a second supplemental silicon layer ( # 46) is provided over the first-reacted silicide region ( # 44) and subsequently performing a RTA process to convert the first reacted silicide region into a second-reacted silicide region ( fig. 9, # 44 converted to # 48 on top of the gate # 36) to prevent junction leakage problem.

AAPR, Doan and Besser are analogous art and it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings AAPR And Doan with Besser to include Besser's second silicon layer, RTA etc. in AAPR AND Doan's method steps to prevent junction leakage problem . ( Besser col. 5 line 65- col. 6 line 5).

With respect to claim 9, Applicants' state that Doan does not teach a second RTA to convert the first reacted silicide regions in to second reacted silicide regions.

However, Doan in col. 7 lines 34-36, teaches converting titanium silicide to a species substantially composed of  $TiSi_2$  by a final heat treatment.

Applicants' further contend that Doan does not teach the reaction of the polysilicon layer with first polysilicon layer in the gate layer and the source/drain active areas.

However, Doan in col. 7 line 25-34, teaches the formation of titanium silicide contact pads # 36 by the reaction of silicon in the transistor gate region and active region 14 b with the titanium layer.

Thus one of ordinary skill in the art would be motivated to combine the teachings of references from analogous art namely AAPR , Doan and Besser.

Therefore the rejections of claims 1-9 and 19-21 and claim 22 (to the extent understood) are proper and are maintained for the reasons previously stated and those stated above.

With respect to claim 23, AAPR, Doan and Besser teach the method of making a semiconductor device including providing substrate, silicon region on insulator ( see rejection of claim 1 in O/A of 7/18/00), metal layer ( AAPR-Applicants' specification page 2 lines 7-9) , first RTA ( AAPR Applicants' specification page 2 lines 9-12), forming a supplemental silicon layer ( Besser fig. 8 # 46), performing second annealing to convert first reacted silicide region into a second –reacted silicide region wherein the supplemental silicon layer and the first-reacted silicide region react ( Besser fig. 9 # 48 on top of the gate converted from # 46 of fig. 8) and a silicon layer remains between the second reacted silicide region and the insulating layer ( Besser col. 6 lines 4-5).

With respect to claim 24, AAPR, Doan and Besser teach the method of making a semiconductor device including : claim 24 recites all the steps of claim 23 ( for which

see above teachings) and further recites a doping step wherein an impurity of the same conductivity type as the silicon region is doped into the supplemental silicon layer (Doan Fig. 8 , col. 6 lines 17-30).


Applicant's arguments filed 5/9/2001 and 7/12/2001 have been fully considered but they are not persuasive for reasons set out in detail above.

Any inquiry concerning this communication should be directed to Steven H. Rao at telephone number 703-306-5945.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703- 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703- 308-0956.

SK  
9/20/07

  
Olik Chaudhuri  
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